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July 11, 2016

Marlene S. Dortch
Secretary
Federal Communications Commission
445 12th Street SW
Washington, D.C. 20554

**Re: Ex Parte Statement**
**WT Docket No. 13-49**

Dear Ms. Dortch:

It has recently come to the attention of the Aerospace and Flight Test Radio Coordinating Council, Inc. ("AFTRCC") that the Wireless Internet Service Providers Association ("WISPA") has filed a Petition for Partial Reconsideration in the above-captioned proceeding. That Petition seeks a relaxation of the out-of-band emission ("OOBE") limit applicable to U-NII devices operating in the 5150-5250 MHz band.

The Petition argues that the Commission "did not fairly consider evidence of critical importance submitted by WISPA and others . . ." , and that "[c]ontrary to the Commission's assertion in the [*Memorandum Opinion and Order*], the record shows that the requested less stringent OOBE limit would not create harmful interference to protected services in the adjacent 5.091-5.150 MHz band [sic]. . . ." (Petition at 2).[1] In support the Petitioner references earlier filings by itself and others. It argues that the decision "compromises the ability of rural Americans to receive affordable access to broadband service." See Petition at note 6 and page 5.

AFTRCC submits this ex parte statement in order to address deficiencies in the Petition insofar as aeronautical mobile telemetry ("AMT") is concerned (AFTRCC's Membership is shown in the attachment).

[1] *Memorandum Opinion and Order* in ET Docket No. 13-49, FCC 16-24, 31 FCC Rcd 2317 (2016).

In the *Memorandum Opinion and Order* at issue, the Commission observed that it had allocated the 5091-5150 MHz band for AMT and the airport surface communications system, AeroMACS, and that the band was also used for Globalstar feeder links. It further observed that the band was restricted, meaning that "low power, non-licensed transmitters are not allowed to place any portion of their fundamental emission [in the band] because of potential interference to sensitive radio communications . . . ." *Id.* at para. 31. It then went on to say:

> "We decline to adopt the WISPA et al. or the Fastback proposal to increase the allowable emissions from U-NII band devices into the restricted band below 5.15 GHz. The restricted bands were created to protect radio communications services that are sensitive to interference and that provide critical benefits to public safety and national security. WISPA and Fastback have not offered any analysis showing that increasing the emissions limit in this restricted band would not create an unacceptable risk of interference in the restricted band."

*Id.* at para. 34 (footnotes omitted). In so doing, the Commission adhered to its position as adopted in the *First Report and Order*, 29 FCC Rcd 4127 (2014) at para. 119 ("*First Report and Order*"), a position for which "the record show[ed] broad support for adopting the tighter unwanted emission limits of Section 15.407 . . . ." *Id.* at paras. 115 and 119.

A review of the Petition and the filings cited therein (*id.* at note 6) shows that the Commission was correct, i.e. the Petitioner failed to demonstrate that increasing the emissions limit in this restricted band would not create an unacceptable risk of interference for AMT, and perhaps other protected systems operating in the restricted band as well.[2]

For example, the Petition at note 6 cites a June 2, 2014 Petition for Partial Reconsideration by Mimosa Networks, Inc. ("Mimosa"). The Mimosa Petition maintains that, "in the case of transmitting antennas with directional gain greater than 6 dBi, the emissions limit should increase to match the amount by which the directional gain of the antenna exceeds 6 dBi." Mimosa Petition at 9.

However, as explained in the attached Engineering Statement by Daniel G. Jablonski, Ph.D., this proposition does little to answer the case at hand. Among other things, he notes that there is no analysis of the effects of the relaxed OOBE using the established protection criteria for AMT found in Recommendation ITU-R M. 1459, nor any quantification of aggregate interference effects from tower mounted transmitters operating consistent with the proposed relaxed limits.[3]

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[2] This may be true for the other two incumbents, Globalstar, and AeroMACs, but the views expressed here are limited to AMT.

[3] While the Mimosa Petition argues that the tighter emission limits will disrupt long-distance backhaul links (*id.* at 6 and 8), until adoption of the *First Report and Order* the 5150-5250 MHz band was limited to indoor operation

Other citations by the Petitioner are to like inconsequential effect. A March 23, 2015 filing (described as the Consensus Proposal) provides no analysis at all, even for the dB-by-dB adjustment.[4] A September 25, 2015 Fastback Networks, Inc. filing includes slides seeking to show the impact to incumbent users in the adjacent restricted band, but fails to mention AMT.[5]

The WISPA Petition also cites to an October 7, 2015 filing on behalf of Fastback (*id.* at note 15). That filing references AFTRCC's Reply Comments in ET Docket No. 15-99. The AFTRCC Comments support the pending allocation for AMT in the 4400-4940 and 5925-6700 MHz bands, with Fastback observing that the U-NII-1 emissions it proposes would be 50 dB lower than what AMT would face from fixed service and electronic newsgathering systems. *Ibid.*

But the Petitioner's point is irrelevant to the case at hand. Unmentioned is the fact that the 4/6 GHz incumbents are licensed systems; that the AMT operations would avoid those licensed systems by careful coordination; and that there is, for example, substantial vacant spectrum and/or geographic areas where AMT operations can be conducted on an interference-free basis as computed using well-established protection criteria and validated link budget methodologies.

By contrast, U-NII devices are unlicensed -- an AMT operator would not know where the U-NII-1 devices are, and could not be sure that one of the Petitioner's outdoor, higher power devices would not light up "next door." While that is a result of the Commission's outdoor dispensation for U-NII-1 devices, the Petitioner's proposal to relax the OOBE limit would make that situation worse.

Finally, it should be noted that this is not the first petition for reconsideration WISPA has filed in this proceeding. On June 2, 2014 it filed a Petition for Partial Reconsideration of the *First Report and Order*. However, that Petition was expressly limited to tighter emission limits for the 5725-5850 MHz band; it said nothing about the *First Report and Order's* application of tighter OOBE limits to 5150-5250 MHz In other words, current assertions that retention of stringent OOBE limits for 5150-5250 MHz "compromises the ability of rural Americans to

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only; i.e. there could have been no such disruption. Likewise, the Mimosa Petition argues that tighter emission limits are unnecessary for the U-NII-3 band given the 75 MHz separation from terminal doppler weather radar. *Id.* at 7. However, there is no spectrum separation at all between U-NII-1 operations and incumbent systems in the adjacent, restricted band.

[4] See WISPA Petition at note 6.

[5] *Ibid.*

receive affordable access to broadband service," are at odds with its 2014 Petition when the 5150-5250 MHz OOBE issue could have been raised by WISPA, but was not.[6]

AFTRCC appreciates the U-NII desire to further expand use of the 5150-5250 MHz band. However, from the information presented the relaxed OOBE limit would materially compromise AMT use of the 5091-5150 MHz band. While AFTRCC is prepared to consider additional information that might be proposed, the *Memorandum Opinion and Order* clearly reached the correct conclusion and the Petition adds nothing of consequence to warrant the Commission's reconsideration.

Accordingly, for the foregoing reasons, the Petition should be denied or dismissed.

Respectfully submitted,

William K. Keane
*Its Counsel*

cc: Julius Knapp
Bruce Romano
Karen Rackley
Aole Wilkins
Jamison Prime
Stephen E. Coran
Paul A. Cicelski

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[6] *Id.* at 5. The *Notice of Proposed Rulemaking*, 28 FCC Rcd 1749 (2013)(the "*Notice*") clearly teed up the proposed tightening of OOBE limits for U-NII bands. *Id.* at para. 34 ("we are proposing that the more restrictive limits in Section 15.407 be required for digitally modulated devices"). Yet, the change now sought for 5150-5250 MHz OOBE appears to have received scant attention in response to the *Notice* and prior to adoption of the *First Report and Order*. The main focus on the U-NII side seems to have been on, for example, 5725-5850 MHz and removal of the outdoor prohibition on 5150-5250 MHz.

# Aerospace and Flight Test Radio Coordinating Council Members

# Engineering Statement

This Engineering Statement responds to arguments made by the Wireless Internet Service Providers Association ("WISPA") in its Petition for Partial Reconsideration. The Petition seeks a change in the Commission's Rules so as to allow additional out-of-band emissions ("OOBE") from the U-NII-1 band, 5150-5250 MHz, into the adjacent restricted band.

In particular, WISPA asks for revision of Rule 15.407 so as to allow "the emissions limit between 5.091-5.35 GHz [to be] increased by the amount in dB that the directional gain of the antenna exceeds 6 dBi; provided that the directional gain above 6 dBi is oriented at 30 degrees or less above the horizon." Petition at 2. In support, the Petition relies substantially on an earlier Petition filed by Mimosa Networks, Inc. ("Mimosa"), and statements therein that:

> The fundamental problem that exists here is that the FCC's regulations allow for higher EIRP (through higher antenna gain) in point-to-point cases, but they don't proportionately allow for a higher emissions limit. . . . The probability that high gain radios cause interference decreases with the increasing gain, since they only emit power in a small volume.

Mimosa Petition, Appendix A, page 7.

However, this proposition does little to answer the quantitative question as to whether interference might nonetheless be caused to AMT -- or other adjacent, restricted band systems.

Preliminarily, the predicted 1 dB-per-dB side-lobe reduction overstates the reduction in sidelobe gain. There is only ~½ dB reduction , not a 1 dB- per-1 dB increase in mainlobe gain. This is true for two dimensional apertures, including both parabolic dishes and sectoral antennas. Granting the dB-per-dB request will thus result in an increase in out-of-band emissions into the restricted band.

Put differently, an accurate engineering analysis will demonstrate that the 1 dB-per-dB antenna proposal increases, rather than holds fixed, the out-of-band emissions radiated by the entirety of an antenna's sidelobes.

Moreover, the "typical" U-NII point-to-point backhaul link referenced in the Petition has a 23 dBi antenna and a beamwidth on the order of 8 degrees. Not only is an 8 degree beamwidth not trivial, but no attempt is made to show that these long-distance links would not be pointed toward AMT ground station antennas. AMT antennas have very high receive gains on the order of 30-40 dBi, and are mounted above ground level in order to track distant aircraft and missiles. In other words, interference to these ground station antennas can occur at correspondingly long distances.

Mimosa refers to backhaul antennas as being "ground-based," but clearly regards its proposed increases in antenna gain and consequential OOBE as also enabling longer backhaul links. These would, by necessity, involve raising antennas above ground level, i.e. a 25 km line

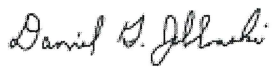
of sight link (as referenced in the Fastback filing of Sept. 25, 2015 at slide 7) requires a minimum tower height above ground of 12 meters, and likely more.

The Fastback filing of September 25, 2015 proposes that there be an additional relaxation, from -27 to -17 dBm per MHz, of the maximum EIRP permitted in the 5091 – 5150 MHz band. This power increase is necessary, in addition to the line of sight requirement, to close the backhaul link at 25 km, rather than 10 km.

However, as the length of a U-NII backhaul link increases, so does the likelihood of interference in the aggregate to AMT ground stations. Put another way, AMT would experience interference in areas where AMT operations could otherwise be conducted interference-free. Despite this, there is no quantitative analysis by U-NII interests regarding this situation, much less an analysis utilizing AMT protection criteria set forth in the well-established Recommendation ITU-R M.1459.

Instead, there is only an unsupported assertion that AMT would experience 50 dB greater emissions in the 5925-6700 MHz band, for example, than it would experience from the proposed relaxation of U-NII-1 OOBE into the restricted band. Fastback ex parte October 7, 2015 at page 2. What this overlooks, however, is the fact that AMT use of 5925-6700 MHz would be on a coordinated basis with licensed operators, whereas U-NII devices are unlicensed and not subject to any coordination requirement with AMT or other restricted band systems.

In conclusion, the Commission was entirely correct in saying that U-NII parties "have not offered any analysis showing that increasing the emissions limit in this restricted band would not create an unacceptable risk of interference [to AMT] in the restricted band." Memorandum Opinion and Order, FCC 16-24, at para. 34.



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